

# 4.1

## Classifying Triangles

**Goal** Classify triangles by their sides and by their measures.

### VOCABULARY

**Triangle** A triangle is a figure formed by three segments joining three noncollinear points.

**Vertex** A vertex of a triangle is a point that joins two sides of the triangle.

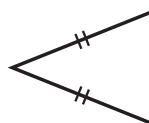
### CLASSIFICATION OF TRIANGLES BY SIDES

**Equilateral Triangle**



3 congruent sides

**Isosceles Triangle**



At least 2 congruent sides

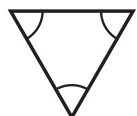
**Scalene Triangle**



No congruent sides

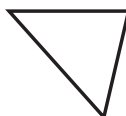
### CLASSIFICATION OF TRIANGLES BY ANGLES

**Equiangular Triangle**



3 congruent angles

**Acute Triangle**



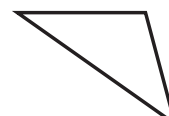
3 acute angle(s)

**Right Triangle**



1 right angle(s)

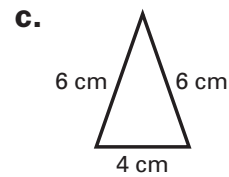
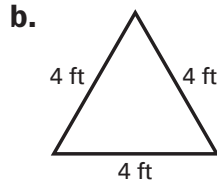
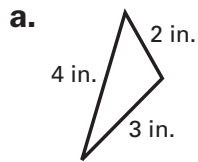
**Obtuse Triangle**



1 obtuse angle(s)

**Example 1** *Classify Triangles by Sides*

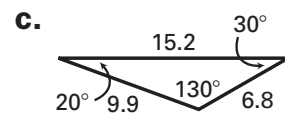
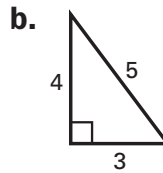
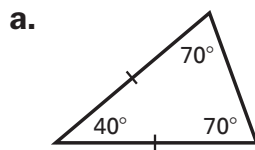
Classify the triangle by its sides.

**Solution**

- a. Because this triangle has no congruent sides, it is scalene.  
b. Because this triangle has 3 congruent sides, it is equilateral.  
c. Because this triangle has 2 congruent sides, it is isosceles.

**Example 2** *Classify Triangles by Angles and Sides*

Classify the triangle by its angles and by its sides.

**Solution**

- a. Because this triangle has 3 angles with measures less than  $90^\circ$ , it is acute. Because it has 2 congruent sides, it is isosceles. So, it is a(n) acute isosceles triangle.
- b. Because this triangle has a right angle, it is right. Because it has no congruent sides, it is scalene. So, it is a(n) right scalene triangle.
- c. Because this triangle has one angle greater than  $90^\circ$ , it is obtuse. Because it has no congruent sides, it is scalene. So, it is a(n) obtuse scalene triangle.

### Follow-Up

Can a triangle be both acute and obtuse?

No

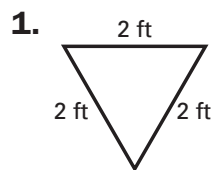
Can a triangle be both equilateral and acute?

Yes

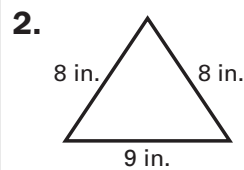
Can a triangle be both scalene and isosceles?

No

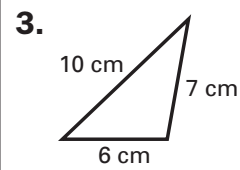
✔ **Checkpoint** Classify the triangle by its sides.



equilateral

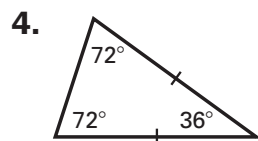


isosceles

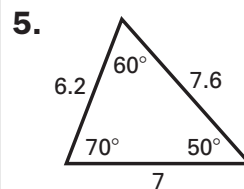


scalene

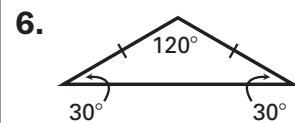
Classify the triangle by its angles and by its sides.



acute isosceles



acute scalene



obtuse  
isosceles

### Example 3 Identify the Parts of a Triangle

Identify which side is opposite each angle.

#### Solution

$\overline{BC}$  is the side that is opposite  $\angle A$ .

$\overline{AC}$  is the side that is opposite  $\angle B$ .

$\overline{AB}$  is the side that is opposite  $\angle C$ .

